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Left ventricular function on tissue perfusion and renal outcomes in critically ill patients with sepsis

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Case Study: Background: Left ventricular(LV) dysfunction has been regarded as a predictor of mortality in patients with sepsis. However, it remains uncertain whether LV dysfunction deteriorates multiple organ failure by impairing tissue perfusion or it has an independent impact. In this study, we investigated the association between LV dysfunction and tissue perfusion, and their impacts on renal outcomes.

Methods: We retrospectively reviewed a total of 162 adult patients with sepsis who met the Sepsis-3 definition. Subjects included 83 (51.2%) with normal LV function, 39 (24.1%) with diastolic dysfunction defined as the septal E/e' ratio >15 among patients with ejection fraction \geq 50% and 40 (24.7%) with systolic dysfunction defined as an ejection fraction <50%. Tissue perfusion was assessed using the blood lactate levels.

Results: The initial and 24h levels of lactate, and lactate clearance did not differ regardless of the presence of LV dysfunction ($P=0.861$, 0.907 and 0.363). The incidence rate of acute kidney injury (AKI) among the patients with initial lactate <2 mmol/L was higher in those with LV dysfunction ($P=0.044$), conversely, the incidence rate was comparable among the patients with initial lactate \geq 2 mmol/L ($P=0.797$). In multivariate analysis, risks of AKI increased if subjects had blood lactate levels \geq 2 mmol/L or systolic dysfunction ($P=0.032$ and 0.090), but the probability of renal replacement therapy depended on previous chronic kidney disease and daily fluid balance. On the other hand, renal replacement therapy-free days were shorter in those with LV dysfunction, independent of previous chronic kidney disease ($P=0.003$). Renal function at discharge was not significantly related to the lactate levels and LV function ($P=0.688$ and 0.174)

Conclusion: LV dysfunction might not influence tissue perfusion, but it could have unfavorable impacts on renal outcomes in patients with sepsis. Besides to individualized therapies tailored their LV function, therapeutic options for preserving tissue perfusion should be warranted.